

Listing of Claims:

1. (Currently Amended) A memory system on a chip, comprising:

a configurable memory having a first mode of operation wherein the configurable memory is configured as a cache and a second mode of operation wherein the configurable memory is configured as a local, non-cache memory, wherein the configurable memory comprises a memory array in which both ~~portion for storing~~ tag bits and data bits are stored in a single data line in the memory array ~~portion~~, in the first mode of operation.

2. (Previously Presented) The memory system of claim 1, wherein a selection of any of the first mode of operation and the second mode of operation is capable of being overridden by an other selection of an other of the first mode of operation and the second mode of operation.

3. (Previously Presented) The memory system of claim 1, wherein the first mode of operation or the second mode of operation is selected at the burn-in time.

4. (Original) The memory system of claim 1, wherein the configurable memory is capable of having either the first mode of operation or the second mode of operation selected at a power-up time.

5. (Original) The memory system of claim 4, wherein the first mode of operation or the second mode of operation is selected at the power-up time using an external signal

6. (Original) The memory system of claim 1, wherein the configurable memory is capable of having either the first mode of operation or the second mode of operation selected during a program execution.

7. (Original) The memory system of claim 6, wherein the first mode of operation or the second mode of operation is selected during the program execution based upon a value of a special configuration register.

8. (Original) The memory system of claim 6, wherein the first mode of operation or the second mode of operation is selected during the program execution based upon a value of an external signal.

9. (Previously Presented) The memory system of claim 6, wherein the first mode of operation or the second mode of operation is selected during the program execution based upon comparing a supplied address to at least one address range contained in at least one configuration register.

10. (Original) The memory system of claim 1, wherein the configurable memory is capable of having either the first mode of operation or the second mode of operation selected based upon a result of comparing a supplied address to a range of addresses.

11. (Original) The memory system of claim 10, wherein the range of addresses are determined at a burn-in time.

12. (Original) The memory system of claim 10, wherein the range of addresses are determined at a boot-up time.

13. (Original) The memory system of claim 10, wherein the range of addresses are determined dynamically.

14. (Original) The memory system of claim 10, further comprising a configuration register for storing the range of addresses.

15. (Currently Amended) The memory system of claim 1, wherein the configurable memory comprises:

~~a memory array; and~~
memory configuration logic for selecting the first mode of operation or the second mode of operation.

16. (Original) The memory system of claim 1, wherein the configurable memory is capable of selecting one of a local memory read mode and a local memory write mode in the first mode of operation and is further capable of selecting one of a cache read mode and a cache write mode in the second mode of operation.

17. (Previously Presented) The memory system of claim 2, wherein the selection may be overridden by the other selection dynamically.

18. (Original) The memory system of claim 1, wherein the configurable memory comprises a plurality of static random access memory cells.

19. (Original) The memory system of claim 1, wherein the configurable memory comprises a plurality of dynamic random access memory cells.

20. (Original) The memory system of claim 1, wherein the configurable memory is capable of being dynamically employed as a sole memory serving the processor and as a portion of a larger, memory hierarchy.

21. (Original) The memory system of claim 1, wherein the first mode of operation and the second mode of operation are employed concurrently.

22. (Currently Amended) A memory system on a chip, comprising:

a configurable Random Access Memory (RAM) array having a first mode of operation wherein the configurable RAM array is configured as a local, non-cache memory and a second mode of operation wherein the configurable RAM array is configured as a cache,

wherein the first mode of operation or the second mode of operation can be selected during a program execution based on comparing a supplied address to at least one address range contained in at least one configuration register and

~~wherein the configurable RAM array has a memory portion for storing tag bits and data bits in a single data line in the memory portion, in the second mode of operation.~~

23. (Original) The memory system of claim 22, further comprising control logic for selectively providing direct access to the configurable RAM array as the local, non-cache memory in the first mode of operation and as the cache in the second mode of operation.

24. (Currently Amended) The memory system of claim 22, wherein a the single logical line spans several physical macro cells.

25. (Original) The memory system of claim 22, further comprising:
tag match logic for determining a match between the stored tag bits and bits corresponding to a memory access; and
at least one multiplexer for selecting and outputting data corresponding to the memory access, when the match is determined.

26. (Currently Amended) A data storage system, comprising:
at least one microprocessor; and
a configurable memory, integrated with the at least one processor, for servicing the at least one microprocessor in a first mode of operation that emulates a local, non-cache memory and a second mode of operation that emulates a cache, ~~wherein the configurable memory comprises a memory portion for storing tag bits and data bits in a single data line in the memory portion, in the second mode of operation, and~~
wherein a selection of any of the first mode of operation and the second mode of operation is capable of being overridden by another selection of an other of the first mode of operation and the second mode of operation, wherein the first mode of operation or the second

mode of operation can be selected during a program execution based on comparing a supplied address to at least one address range contained in at least one configuration register.

27. (Original) The data system of claim 26, wherein the at least one microprocessor and the configurable memory array are integrated on a single chip.

28. (Original) The data system of claim 26, wherein the at least one microprocessor and the configurable memory array are integrated in a single package.

29. (Currently Amended) A memory system on a chip, comprising:
a processor; and
a configurable memory having three modes of operation, a first mode of operation for emulating a local, non-cache memory, a second mode of operation for emulating a cache, and a third mode of operation for emulating both the local memory and the cache, ~~wherein the configurable memory comprises a memory portion for storing tag bits and data bits in a single data line in the memory portion, in at least the second mode of operation, wherein any of the~~ three modes of operation may be selected at any given time during a program execution based on comparing a supplied address to at least one address range contained in at least one configuration register.

30. (Currently Amended) A method for accessing data, comprising the steps of:

providing a configurable memory on a chip;

providing control logic on the chip for selecting between a first mode of operation and a second mode of operation of the configurable memory and for overriding a previous selection of the first mode of operation or the second mode of operation;

configuring the configurable memory as a local, non-cache memory in the first mode of operation;

configuring the configurable memory as a cache in the second mode of operation;

~~wherein the configurable memory comprises a memory portion for storing tag bits and data bits in a single data line in the memory portion, in the second or third mode of operation; and~~

accessing the data from the configurable memory, based upon a mode of the configurable memory,

wherein the first mode of operation or the second mode of operation can be selected during a program execution based on comparing a supplied address to at least one address range contained in at least one configuration register.

31. (Original) The method of claim 30, further comprising the steps of:

providing at least one microprocessor for servicing memory access instructions for the configurable memory; and

integrating the at least one microprocessor with the configurable memory on the chip.

32. (Original) The method of claim 30, wherein the chip comprises a single chip.

33. (Currently Amended) A method for accessing data, comprising the steps of:

providing a configurable memory in a package;

providing control logic in the package for selecting between a first mode of operation and a second mode of operation of the configurable memory and for overriding a previous selection of the first mode of operation or the second mode of operation;

configuring the configurable memory as a local, non-cache memory in the first mode of operation;

configuring the configurable memory as a cache in the second mode of operation;

~~wherein the configurable memory comprises a memory portion for storing tag bits and data bits in a single data line in the memory portion, in the second mode of operation; and~~

accessing the data from the configurable memory, based upon a mode of the configurable memory,

wherein the first mode of operation or the second mode of operation can be selected during a program execution based on comparing a supplied address to at least one address range contained in at least one configuration register.

34. (Original) The method of claim 33, further comprising the steps of:

providing at least one microprocessor for servicing memory access instructions for the configurable memory; and

integrating the at least one microprocessor with the configurable memory in the package.

35. (Original) The method of claim 34, wherein said integrating step integrates the at least one microprocessor with the configurable memory based upon a chip stack technique.

36. (Original) The method of claim 34, wherein said integrating step integrates the at least one microprocessor with the configurable memory based upon a flip chip technique.

37. (Original) The method of claim 34, wherein said integrating step integrates the at least one microprocessor with the configurable memory based upon a multi-chip module.